

EXHIBIT 2

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S) : Heidrun Grob-Lipski et al.
TITLE : HANDOVER METHOD AND
APPARATUS THEREOF
APPLICATION NO. : 12/648,055
FILED : December 28, 2009
CONFIRMATION NO. : 3073
EXAMINER : Michael T. Vu
ART UNIT : 2617
LAST OFFICE ACTION : October 24, 2011
ATTORNEY DOCKET NO. : LUTZ 201090US01
ALU No. 803365 US

AMENDMENT A

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Responsive to the Office Action mailed October 24, 2011, regarding the above-referenced patent application, the Applicants respectfully request amendment, reexamination and reconsideration of the application.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF THE CLAIMS

1. (Currently Amended) A handover method in a base station of a mobile communication system, said mobile communication system further comprising a plurality of base stations, a telecommunication link being established between a user equipment and said base station, the method comprising:
 - receiving a first measurement report from said user equipment via said telecommunication link, said first measurement report containing an evaluation of signal quality from at least one candidate base station of said plurality of base stations for a handover;
 - selecting a first candidate base station using said evaluation of said signal quality from said first measurement report;
 - initiating a first handover preparation by transmitting a first request to said first candidate base station;
 - determining if said first handover preparation has failed;
 - selecting a set of candidate base stations including at least some of said candidate base stations identified in said first measurement report;
 - initiating a second handover preparation by transmitting a second handover request to ~~at least one~~ a plurality of said set of candidate base stations, if said first handover preparation has failed;
 - selecting a target base station from said set of candidate base stations, if said second handover preparation has not failed;
 - initiating said handover of said user equipment from said base station to said target base station;

wherein said first and said second request are indicative of a set of radio bearers used by said user equipment,

wherein a second measurement report is received from said user equipment, said second measurement report containing a second evaluation of signal quality of at least one of said set of candidate base stations, wherein said plurality of candidate

base stations for said second handover preparation includes at least one of said candidate base stations identified in said second measurement report.

2. (Original) The method of claim 1, wherein said first handover preparation has failed, if a failure message is received from said first candidate base station or if a first predefined time has expired since the transmission of said first handover request.
3. (Canceled) The method of claim 1, wherein a second measurement report is received from said user equipment, said second measurement report containing a second evaluation of signal quality of at least one candidate base stations, wherein said set of candidate base stations for said second handover preparation includes at least one of said candidate base stations identified in said second measurement report.
4. (Original) The method of claim 1, wherein said set of candidate base stations for said second handover preparation includes at least one candidate base station selected using statistics data collected from previous handover preparations related to said base station.
5. (Original) The method of claim 4, wherein said target base station is a candidate base station indicated in said statistics data with a highest percentage of previous successful handovers.
6. (Currently Amended) The method of claim 1, wherein a third measurement report is received from said user equipment before said ~~hand over~~handover is initiated, the method further comprising: sending a third handover preparation to at least an alternative candidate base station from said third measurement report.

7. (Previously presented) The method of claim 1, wherein the target base station is selected after reception of a first handover acknowledgement message from said target base station by said base station, wherein said second handover preparation has not failed if at least said first handover acknowledgement message is received by said base station.
8. (Previously presented) The method of claim 1, wherein said target base station is selected from a subset of said set of candidate base stations, wherein said subset of candidate base stations includes candidate base stations which have sent handover acknowledgement messages to said base station.
9. (Original) The method of claim 8, wherein said target base station is selected from said subset of candidate base stations which has accepted supporting said set of radio bearers being used by said user equipment.
10. (Currently Amended) The method of claim 8, wherein said target base station is selected from said subset of candidate base ~~station~~ stations which have accepted supporting a maximum number of radio bearers from said set of radio bearers being used by said user equipment.
11. (Currently Amended) The method of claim 1, wherein the method further comprises:
 - setting a second predefined time after transmitting said second handover request,
 - wherein said selecting said target base station ~~step~~-further comprises: selecting said target base station which sends a handover acknowledgement message to said base station, if only said handover acknowledgement message is received by said base station during said second predefined time;
 - wherein said selecting said target base station ~~step~~-further comprises: selecting said target base station which has accepted supporting said complete set of radio bearers being used by said user equipment, wherein said target base station is

selected from a subset of said set of candidate base stations, wherein said subset includes candidate base stations which have sent handover acknowledgement messages to said base station, if more than one handover acknowledgement messages is received by said base station.

12. (Currently Amended) The method of claim 11, wherein said selecting said target base station step further comprises:

selecting said target base station which has a maximum number of radio bearers being used by said user equipment, wherein said target base station is selected from said subset of said set of candidate base stations, if no candidate base station from said subset accepts supporting said set of radio bearers being used by said user equipment.

13. (Currently Amended) The method of claim 12, wherein said selecting said target base station step further comprises: selecting said target base station from statistics collected from previous handover preparations, if said second predefined time expires and if no handover acknowledgement messages is received within said second predefined time.

14. (Previously presented) The method of claim 1 implemented in a base station being operable to perform the method.

15. (Previously presented) The method of claim 1 implemented in a computer program product stored on a storage medium, comprising executable program means for causing a base station to perform the method when the program is run on the base station.

REMARKS

The Applicants have now had an opportunity to carefully consider the comments set forth in the Office Action that was mailed October 24, 2011. All of the rejections are respectfully traversed. Amendment, re-examination and reconsideration of the application are respectfully requested.

The Office Action

In the Office Action that was mailed October 24, 2011:

claims 11 – 13 were recognized as including **allowable** subject matter; and

claims 1 – 10 and **14 – 15** were rejected under 35 USC §103(a) as allegedly being obvious in view of U.S. Patent Application Publication No. 2008/0268850 by Narasimha et al. ("Narasimha") in view of US Patent No. 7,818,006 to Kim et al ("Kim").

The Present Application

By way of brief review, the present application is directed toward a handover method and apparatus thereof. In embodiments, if a first handover preparation attempt is determined to have failed, instead of repeating a preparation attempt toward a handover of the mobile device to the same target base station, an alternative base station is selected. **Moreover**, the alternative base station is selected by preparing to handover the mobile device to a plurality of alternative base stations and selecting the target base station to be one of that plurality that acknowledge a successful handover preparation.

The Cited Documents

In contrast, while the primary document relied upon in the Office Action, by **Narasimha**, allegedly discusses a method and apparatus for handover in a wireless communication system, even **the Office Action acknowledges** that Narasimha, **does not** disclose initiating a second handover preparation by transmitting a second handover request to at least one of said set of candidate base stations, if said first handover preparation has failed, as well as other elements recited in **claim 1**. In this regard, the Office Action relies on Kim.

Kim allegedly discusses handover execution and communication resumption in a wireless access system. Kim is directed toward a broadband wireless access system and not a hierarchical structure such as that associated with 2G and 3G mobile communication systems (column 1, lines 20-30).

It is respectfully submitted that contrary to the assertions of the Office Action, Kim **does not disclose or suggest** that the scenario depicted in Fig. 6 is a **second** handover preparation that takes that place after a first handover preparation fails. Accordingly, for at least this reason, it is respectfully submitted that Kim does not cure the deficiencies of Narasimha. It is respectfully submitted that the failures discussed by Narashimha are full handover failures, such as dropped calls (e.g. column 10, lines 8-12, column 5, lines 18-21) and not preparation failures.

The Claims Are Not Obvious

Claims 1 – 10 and **14 – 15** were rejected under 35 USC §103(a) as allegedly being obvious in view of Narasimha and Kim.

However, with regard to the recitation in **claim 1** of determining if said first handover preparation has failed, the Office Action makes a vague citation to both figures 3 and 4. Furthermore, rather than identifying disclosure of the determination of a handover preparation failure, the Office Action **only alleges that** Figs. 3 and 4 "show handover **preparation**". It is respectfully submitted that cited figures 3 and 4 **do not disclose or suggest** determining if a first handover preparation has failed.

Still further, **the Office Action does not even allege** that Kim discloses, and it is submitted that Kim **does not disclose or suggest**, determining if a first handover preparation has failed or performing subsequent operations based on such an initial or first handover preparation failure. If this rejection is to be maintained, a specific identification of the portion or portions of Figs. 3 and 4 of Narasimha the Office believes disclose(s) determining if a first handover preparation has failed is respectfully requested.

For at least the foregoing reasons, **claim 1**, as well as **claims 2** and **4- 15**, which depend therefrom, is not anticipated and is not obvious, even in view of Narasimha and Kim.

Moreover, with regard to claim 1, as indicated above, the Office Action **stipulates** that Narasimha **does not disclose** initiating a second handover preparation by transmitting a second handover request to at least one of said set of candidate base stations if said first handover preparation has failed and selecting a target base station from said set of candidate base stations if said second handover preparation has not failed and initiating said handover of said user equipment from said base station to said target base station wherein said first and second requests are indicative of the set of radio bearers used by said user equipment. In this regard, the Office Action relies on Kim.

In particular, the Office Action relies on Fig. 6 of Kim and the discussion found at column 5, lines 30 – 57.

However, **contrary to the assertions of the Office Action** the cited portions **do not** describe a second handover preparation. **Instead**, it is respectfully submitted that the cited portions describe an initial or first handover preparation, at least in the sense that the plural handover pre-notifications (e.g. S612, S613) occur immediately after an initial handover request S611 from a mobile station 61. This is in stark contrast to the operation recited, for example, in claim 1 of the present application. Where the subject matter of claim 1 attempts an initial handover preparation to a **single** selected target base station when a determination is made that a handover is needed, assuming it will be successful, and sends plural handover preparation messages to plural candidate base stations **if** the initial handover preparation attempt fails, the subject matter of Fig. 6 of Kim operates after a complete handover failure such as a dropped call (column 10, lines 11-12) (i.e., not a preparation failure). It is further noted that the handover failure addressed in Fig. 6 does not occur until step S619, well after the plural handover pre-notification messages S612 and S613. This second handover (i.e., not preparation) failure of Kim is also suggested to be a full dropped call (column 10, lines 49-51).

For at least the foregoing reasons, Kim does not cure the deficiencies of Narasimha and **claim 1**, as well as **claims 2 and 4- 15**, which depend therefrom, is not anticipated and is not obvious, even in view of Narasimha and Kim.

With regard to the recitation in **claim 1** indicating said first and said second requests are indicative of the set of radio bearers used by said user equipment, the

Office Action merely refers to target base station 63 and a second target base station 64 depicted in Fig. 6. **However**, it is respectfully submitted that the mere depiction of base stations in Fig. 6 **does not disclose or suggest** that request messages indicate radio bearers used by user equipment. For example, as indicated in paragraph 10 of the present application (as the paragraphs are numbered in the published version US 2010/0167744 A1), one of the advantages of embodiments of the subject matter of the present application is that the base station ensures finding the best possible candidate that is able to support all or most of radio bearers or services used by the user equipment in the base station. Accordingly, a base station is not a radio bearer and the mere depiction of a base station **does not indicate or suggest** that a request message identifies radio bearers being used by user equipment. Radio bearers are further discussed in the present application in, for example, paragraphs 18 – 21, 33, 36, 43, 46, 49 – 51 and 55.

For at least the foregoing additional reasons, Kim does not cure the deficiencies of Narasimha and **claim 1**, as well as **claims 2** and **4- 15**, which depend therefrom, is not anticipated and is not obvious, even in view of Narasimha and Kim.

Additionally, **claim 1** has been amended to include subject matter from **claim 3**. That subject matter includes, for example, an indication that a second measurement report is received from said user equipment, said second measurement report containing a second evaluation of signal quality of at least one of said set of candidate base stations. In this regard, the explanation of the rejection of **claim 3** cites paragraphs 9, 24 and 61 of Narasimha.

However, in making the citations, **the Office Action does not allege** that the cited portions disclose the subject matter regarding a second measurement report recited in **claim 3**. Instead, the Office Action alleges discussion of an acknowledgment of a measurement report. Furthermore, cited paragraph 9 summarizes the method of Narasimha and refers only to a measurement report. Cited paragraph 9 **does not disclose or suggest** a second measurement report. Cited paragraph 24 provides additional detail regarding the method summarized in paragraph 9. Cited paragraph 24 also refers to a measurement report sent from a mobile station to a base station and **does not disclose or suggest** a second measurement report from a mobile station to a

base station. Cited paragraph 61 again refers to a user equipment's measurement report and makes further reference to an acknowledgment to the measurement report. It is respectfully submitted that an acknowledgment is not a second measurement report and the citations to paragraph 61 do not support the assertions of the Office Action that Narashimha discloses a second measurement report of the type recited previously in **claim 3** is now recited in **claim 1**.

Additionally, the Office Action cites paragraph 18 in regard to additional recitation. For completeness sake, it is respectfully submitted that paragraph 18 refers to a source base station receiving a measurement report from the mobile station and **does not disclose or suggest** a second measurement report of the type now recited in **claim 1**.

For at least the foregoing additional reasons, **claim 1**, as well as **claims 2** and **4-15**, which depend therefrom, is not anticipated and is not obvious, even in view of Narasimha and Kim.

Claim 2 indicates that the first handover preparation has failed if a failure message is received from the first candidate base station or if a first predetermined time is expired since the transmission of the first handover request. In this regard, the Office Action cites figure 3, column 7, lines 43 – 63 of Kim with regard to the first alternative and to column 9, lines 1 – 16 of Kim with regard to the second alternative.

However, even if, as asserted by the Office Action, Fig. 3 of Kim depicts a handover failure, that, in and of itself, **does not disclose or suggest** the reception of any failure message. Moreover, it is respectfully submitted that Fig. 3 of Kim is a message flow diagram and no error message is depicted in relation to the handover failure S320 depicted in Fig. 3. Accordingly, clarification of the assertion of the Office Action is respectfully requested.

Furthermore, the cited portion of column 70 referring to a pre-notification response message **does not disclose or suggest** a failure message. Indeed, at lines 64 – 67, the cited portion indicates that a pre-notification response message may include: acknowledgment information pertaining to the handover pre-notification message and capability information pertaining to the requested quality of service. It is respectfully submitted that this discussion does not disclose a failure message.

Still further, the cited portion of column 9 indicates that the former serving base station may maintain resources and information associated with the MSS for a predetermined time duration and **does not disclose or suggest** that a first handover preparation has failed if a predefined time is expired since the transmission of the first handover request.

If this rejection is to be maintained, a more detailed explanation as to why the Office believes the cited portion supports the rejection is respectfully requested.

For at least the foregoing additional reasons **claim 2** is not anticipated and is not obvious, even in view of Narasimha and Kim.

With regard to **claim 4**, the Office Action cites paragraphs 9 and 18 – 19 of Narasimha. However, **claim 4** recites *inter alia*: at least one candidate base station is selected using statistics data collected from previous handover preparations and the cited paragraphs are silent with regard to statistics data collected from previous handover preparations. Instead, cited paragraphs 9 and 18 indicate that a base station receives a measurement report and that the base station determines whether or not a mobile station should perform a handover from the source base station to the target base station. Cited paragraph 19 discusses random-access channel preambles and their use in preventing a plurality of mobile devices from trying to initiate a connection at the same time. Accordingly, **if this rejection is the maintained**, clarification of the assertions of the Office Action is respectfully requested.

For at least the foregoing additional reasons **claim 4**, as well as **claim 5**, which depends therefrom, is not anticipated and is not obvious, even in view of Narasimha and Kim.

Claim 5 indicates that the target base station is a candidate base station indicated in said statistics data with a highest percentage of previous successful handovers. In this regard, the Office Action cites column 3, lines 11 – 37 of Kim which the Office Action characterizes as disclosing "based on a signal qualities".

However, discussion of making decisions based on signal qualities **does not disclose or suggest** the use of statistics data or the selection of the base station with the highest percentage of previously successful handovers. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons **claim 5** is not anticipated and is not obvious, even in view of Narasimha and Kim.

Claim 6 recites aspects related to the use of the third measurement report. In this regard, the Office Action cites Fig. 6 of Kim and asserts that Fig. 6 “shows requested handover from different base stations”. However, even if this assertion were correct, that **would not disclose or suggest** the use of the third measurement report received from the user equipment, as is recited in **claim 6**.

For at least the foregoing additional reasons **claim 6** is not anticipated and is not obvious, even in view of Narasimha and Kim.

With regard to **claims 9 and 10**, the Office Action cites paragraph 63 of Narasimha. However, paragraph 63 is silent with regard to radio bearers or the acceptance by a candidate base station of the set of radio bearers being used by said user equipment. In this regard, arguments similar to those submitted in support of **claim 1** are submitted in support of **claim 9**. Furthermore, paragraph 63 is silent in regard to selecting a target base station from a subset that have accepted supporting a maximum number of radio bearers being used by the user equipment. Radio bearers are discussed in the present application in, for example, paragraphs 10, 18 – 21, 33, 36, 43, 46, 49 – 51 and 55 as the paragraphs are numbered in the published version.

For at least the foregoing additional reasons **claims 9 and 10** are not anticipated and are not obvious, even in view of Narasimha and Kim.

Telephone Interview

In the interests of advancing this application to issue the Examiner is invited to telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

CONCLUSION

Claim 3 has been canceled. **Claims 1** and **10-13** have been amended. For at least the reasons detailed above, it is respectfully submitted all claims remaining in the application (**Claims 1, 2** and **4-15**) are now in condition for allowance. Accordingly, an early indication thereof is respectfully requested.

☒ Remaining Claims, as delineated below:

(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT LESS HIGHEST NUMBER PREVIOUSLY PAID FOR		(3) NUMBER EXTRA
TOTAL CLAIMS	15	- 20 =	0
INDEPENDENT CLAIMS	1	- 3 =	0

☒ This is an authorization under 37 CFR 1.136(a)(3) to treat any concurrent or future reply, requiring a petition for extension of time, as incorporating a petition for the appropriate extension of time.

☒ The Commissioner is hereby authorized to charge any filing or prosecution fees which may be required, under 37 CFR 1.16, 1.17, and 1.21 (but not 1.18), or to credit any overpayment, to Deposit Account Number 06-0308.

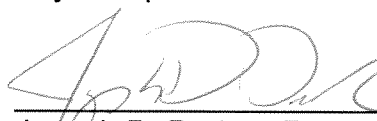
In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to telephone the undersigned, at 216.363.9000.

Respectfully submitted,

Fay Sharpe LLP

Date

January 17, 2012


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<u>January 17, 2012</u> Date	<u>Michelle M. McVaney</u> Michelle M. McVaney

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